USEPA/OECA/OC
State and Tribal Assistance Grants (STAG) 2000-2001
Massachusetts: Development and Evaluation of an IPM Compliance Assistance Program…in Schools, Daycare Centers and Childcare Programs
1st Quarter Report, 2002
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Quarterly Reporting Form for EPA's 2001, 2002 and 2003 Enforcement and Compliance Assurance Grants

Reporting Period: Year: 2002

☑ Jun-Dec (due last working day Jan)
☐ Jan-Mar (due last working day Apr)
☐ Apr-Jun (due last working day Jul)
☐ Jul-Sep (due last working day Oct)

I. Information

State and Department: Massachusetts Department of Food and Agriculture

Title of Project: Development and evaluation of an Integrated Pest Management compliance assistance program to protect the health of children in schools, daycare centers and child care programs

Grant Contact Person:
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Funds Received by State: $200,000 (June 4, 2001):

EPA Regional Project Officer: Rob Koethe

Author of report: Gerard Kennedy

II Status of Project Milestones

Project Milestones	**Anticipated Completion Date**	**Completion Date**
1. Develop curricula and training materials to inform and instruct Massachusetts school personnel in the principles of IPM and the laws pertaining to the implementation of IPM in schools	Summer 2001	Completed
2. Conduct series of statewide training sessions for school personnel and pest management professionals in the principles of school IPM and its legal status in Massachusetts Series One Series Two	 Summer 2001 Fall 2001	 Completed Completed
3. Development of IPM Schools website (a) General information about school IPM and the requirements under the Children's Protection Act (b) Creation of Interactive IPM Plan Development Tool	 Fall 2001 November 2001	 Completed Completed
PROJECT EVALUATION MEASURES ***OUTPUT MEASUREMENTS:***		
The numbers of persons attending educational sessions	Fall 2001	Completed
The number of "hits" on the website and an analysis of the traffic.	November 2001	Ongoing
The number of schools submitting plans will be a useful output measurement.	November 2001	Ongoing

OUTCOME MEASURES		
Changes in Awareness and Understanding		
Workshop evaluation forms	Fall 2001	Completed
The numbers and types of schools accessing and interacting with the website to construct an individual IPM plan for their school. This information will feed directly into a database.	November 2001	In Progress
Types of schools submitting IPM plans	June 2003	In Progress
Changes in pesticides management practices		
Number of schools who develop and submit their IPM plans to the State.	Ongoing	In Progress
The number of schools who improve their understanding of pest management. Document pest control procedures and quantification of pesticide use patterns for 12-24 schools (depending on availability and logistics) that will be adopting an IPM plan. In the second year, we will closely monitor pesticide use patterns and controls within those schools and compare the results to the previous year and to an additional 12-24 new sites.	June 2003	Under development

III. Status of Project Completion

The project is on schedule to meet its target deadline of three years. A contractor, Ditherdog, has been hired to replace Dr. Coler and Mr. Slocombe (see previous progress report). The evaluation questionnaire is being used in the field by the inspectors. A plan for the statistical design and analysis of the evaluation has been developed.

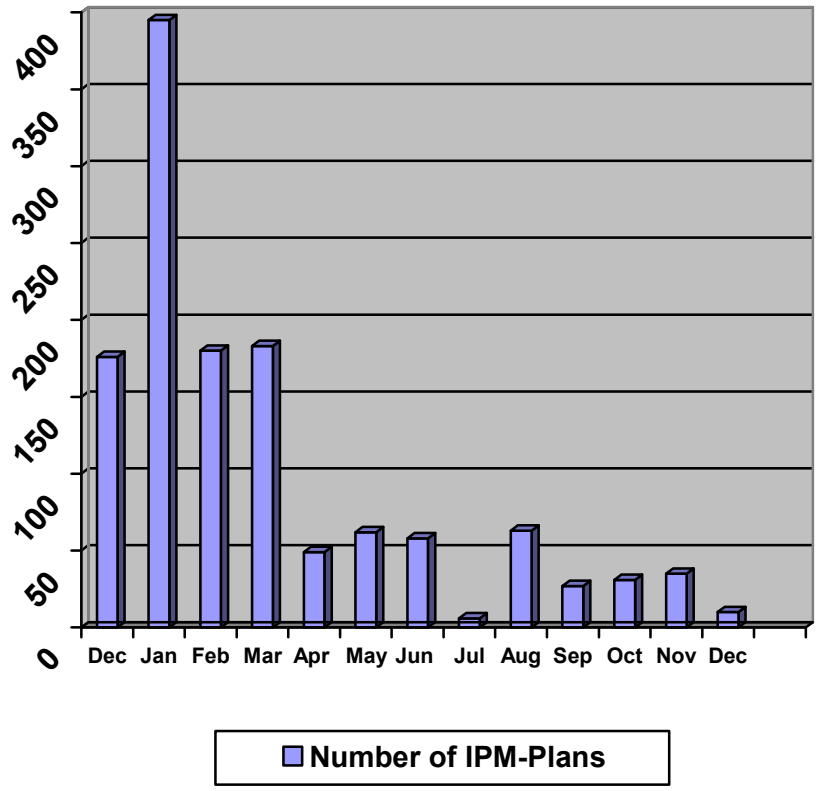
IV Results:

1. A statistically valid evaluation plan has been developed by the Statistical Consulting Center at the University of Massachusetts and is attached in Appendix A. The two populations targeted for evaluation are schools where personnel attended the workshops and schools where personnel did not attend the workshops. The goal is to determine if there is any difference between the two populations in terms of compliance with the law and in overall understanding of IPM. Field Inspectors are currently using the attached Facility Information

Questionnaire (see Progress Report Four) in the field. Data will be compiled and analyzed according to the plan developed by UMASS.

2. A contractor has been selected to take over from Dr. Coler. The contractor, Ditherdog LLC, will provide ongoing maintenance, development and trouble-shooting of the interactive website and further develop and provide ongoing maintenance of the website pages as needed. A detailed scope of services is attached in Appendix B in PDF format.

3. IPM Plans continue to be submitted to DFA (Figure One). 1275 schools and daycares have submitted IPM plans to DFA since December 2001 (Figure One).



APPENDIX A

Sampling Report for Massachusetts Department of Food and Agriculture Survey of IPM Knowledge and Compliance in Schools

Statistical Consulting Center
Lederle Research Tower
University of Massachusetts
Amherst, MA 01003

November 14, 2002
Eva Goldwater

I. BACKGROUND:

The proposed survey will have three outcome variables: indoor compliance, outdoor compliance and understanding of IPM theory/practice (each measured on a 0-100 scale), and will be administered to the person responsible for pest management at a sample of Massachusetts schools, daycare centers and school-age childcare facilities. Some of these people have attended an IPM training workshop. The purpose of the survey is to assess whether there are differences in compliance and understanding between the different types of facilities and between those that have attended the IPM workshops and those that have not.

The population sizes to be sampled are:

	Attended workshop	Did not attend workshop	Total
Schools	509	2091	2600
Daycares	262	2051	2313
School-age childcare	26	905	931

II. SAMPLE SIZE ESTIMATES:

We have assumed that the survey is to have a power of at least 0.8 to detect significant differences among either workshop attendance status (Factor A) or type of facility (Factor B), with an alpha error rate of 0.05, using two-way Analysis of Variance.

Under these assumptions, the sample size needed to detect "small" effects would be 170 per cell (i.e. total 1020). "Small" effect size translates into a difference in means of 0.2 of a standard deviation for workshop attendance, and 0.25 of a standard deviation for facility type. (It is not possible to specify absolute differences in mean without knowing the standard deviation.) If we are willing to accept larger effect size (or lower power) for detecting differences among facility types, detecting a small effect due to workshop attendance requires 140 observations per cell (total 840).

A "medium" size effect would detect differences of 0.5 standard deviations in the means for workshop attendance, and 0.65 of a standard deviation for facility type. This could be done with 30 observations per cell (total 180).

Finally, a sample of 50 per cell (total 300) could be used to detect a difference of 0.17 of a standard deviation in the means of workshop attendance, and 0.19 of a standard deviation for facility type.

III. SAMPLING SCHEME:

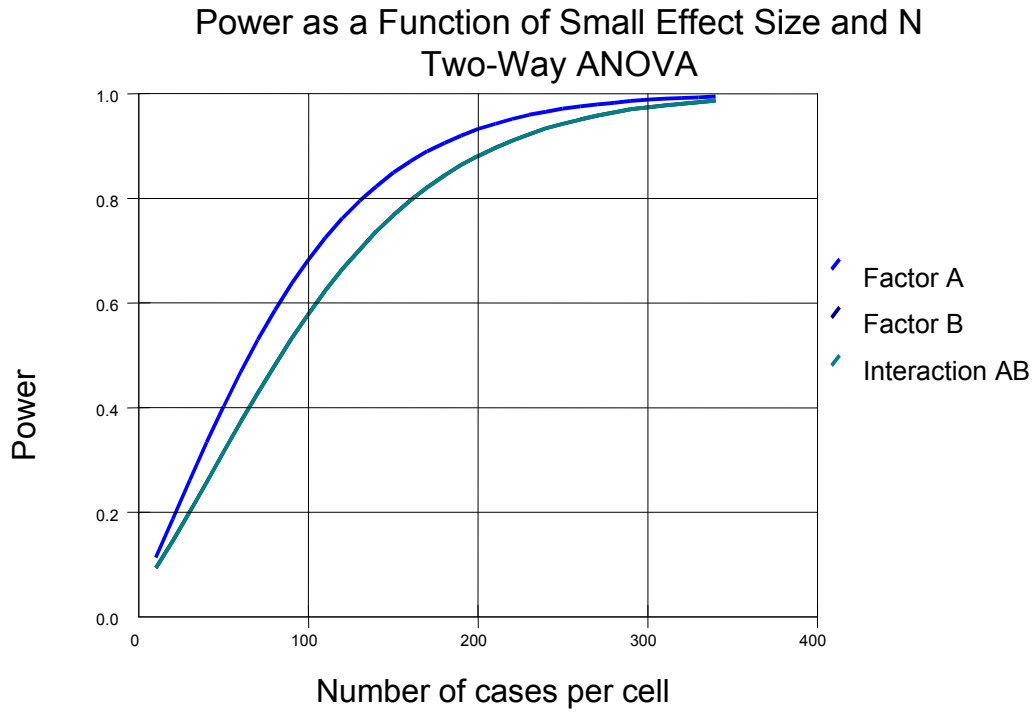
Once the decision on a sample size has been made, you will want to take a simple random sample from each of the six populations. (Note that due to the small number of facilities for school-age childcare that have attended workshops, you will probably need to do a complete census of these 26 facilities.) To get a simple random sample from the six groups:

1. Make separate lists of each of the six groups, and number them sequentially. For example, you will have a list of schools that have attended workshops, numbered 1 to 509, and schools that have not attended workshops, numbered 1 to 2091. (If you already have a list of ALL schools, and it is too difficult to remove the ones that have attended workshops, you could substitute that list, numbered 1 to 2600, for the non-workshop schools list, and adjust for this later.)

2. For each list, generate n uniform random integers in the range of the sequence numbers for that list, where n is the number of facilities to be surveyed per cell (e.g. 30 for "medium" effects). If you use Excel, you can do this with a formula of the form =ROUNDUP(RAND()*(N-1), 0), where N is the total population size for that group. For example, to get random integers for selecting from the 509 schools that attended workshops, use =ROUNDUP(RAND()*508,0). Drag this down to n rows to get n random integers in the range 1-509. To fix this set of selected integers (so the random number generator doesn't keep changing them), copy them and use **Paste Special – Values** to save them in a new column. Repeat for each of the other populations to be sampled.

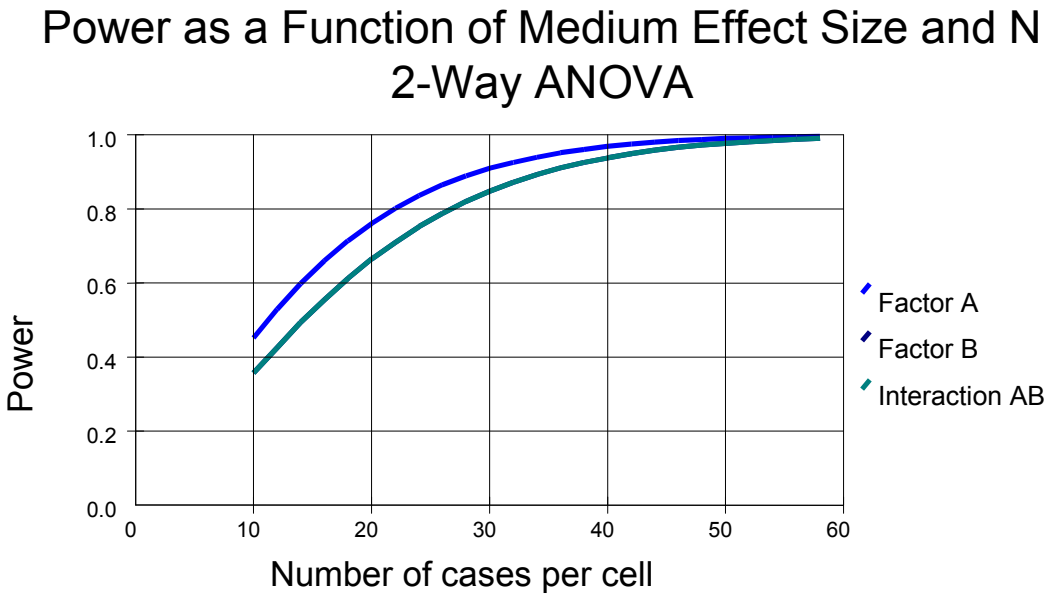
3. From each list, select the schools with the sequence numbers corresponding to the n random numbers. If you substituted lists of ALL schools instead for non-workshop schools in step 1, then some of these random numbers will correspond to schools that have taken the workshop. When this happens, discard that random number and generate additional random numbers as needed until you get n numbers corresponding to n non-workshop schools. Be sure to select schools in the order that the random numbers are generated – do NOT order the random numbers in any way before selecting schools.

The charts on the next three pages show how power varies with sample size for "small", and "medium" effect sizes, respectively, and for the intermediate effect size that would yield power 0.8 for 50 samples per cell



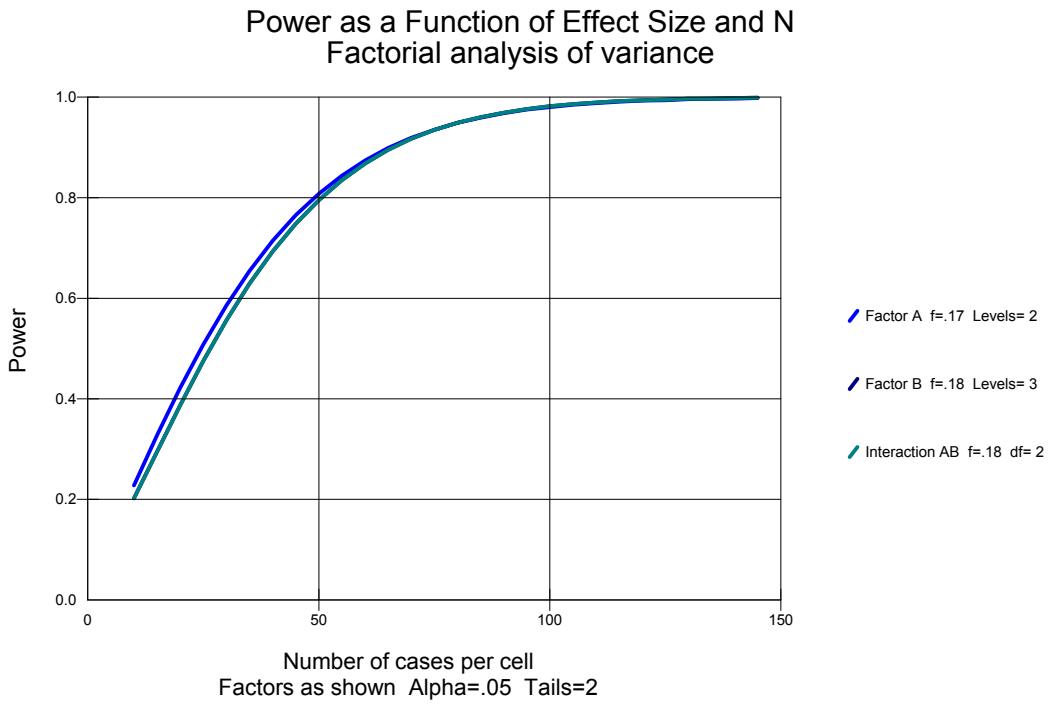
SAMPLE POWER – Small Effect Size (0.01)

N per cell	Factor A f=.10 Levels= 2	Factor B f=.10 Levels= 3	Interaction AB f=.10 df= 2
10	.114	.093	.093
20	.187	.145	.145
30	.261	.201	.201
40	.334	.258	.258
50	.403	.316	.316
60	.469	.373	.373
70	.530	.428	.428
80	.586	.481	.481
90	.637	.532	.532
100	.683	.579	.579
110	.725	.624	.624
120	.762	.665	.665
130	.795	.702	.702
140	.823	.737	.737
150	.849	.768	.768
160	.871	.796	.796
170	.890	.821	.821



SAMPLE POWER – Medium Effect Size (0.25)

N per cell	Factor A f=.25 Levels= 2	Factor B f=.25 Levels= 3	Interaction AB f=.25 df= 2
10	.451	.357	.357
20	.761	.664	.664
30	.910	.848	.848
40	.969	.938	.938
50	.990	.977	.977
60	.997	.992	.992
70	.999	.997	.997
80	1.000	.999	.999
90	1.000	1.000	1.000
100	1.000	1.000	1.000
110	1.000	1.000	1.000
120	1.000	1.000	1.000
130	1.000	1.000	1.000
140	1.000	1.000	1.000
150	1.000	1.000	1.000
160	1.000	1.000	1.000
170	1.000	1.000	1.000



Effect Size for

N=50 per cell at .8 power. (Factor A = Workshop attendance, B=Facility type)

N per cell	Factor A f=.17 Levels= 2	Factor B f=.18 Levels= 3	Interaction AB f=.18 df= 2
10	.228	.202	.202
15	.328	.295	.295
20	.422	.387	.387
25	.508	.475	.475
30	.586	.556	.556
35	.654	.629	.629
40	.714	.693	.693
45	.765	.748	.748
50	.808	.795	.795
55	.844	.835	.835
60	.874	.868	.868
65	.899	.895	.895
70	.919	.917	.917
75	.935	.935	.935
80	.949	.949	.949
85	.959	.960	.960
90	.968	.969	.969
95	.975	.976	.976
100	.980	.982	.982
105	.985	.986	.986
110	.988	.989	.989
115	.991	.992	.992
120	.993	.994	.994
125	.994	.995	.995
130	.996	.997	.997
135	.997	.997	.997
140	.997	.998	.998
145	.998	.999	.999
150	.999	.999	.999